

Serial No. 09/769,128

Art Unit: 1742

Amendments to the Specification

Claims 1-20 (Canceled)

21. (Previously Presented) A liquid composition suitable for use as a dry-in-place phosphating composition for galvanized steel, said composition comprising water and the following dissolved components:

- (a) a concentration of from 53 to 400 g/l of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid;
- (b) a concentration in g/l of zinc cations that has a ratio to said concentration of phosphate ions, measured in g/l as their stoichiometric equivalent as orthophosphoric acid in the liquid composition, that is from 0.005:1.0 to 0.035:1.00;
- (c) a concentration of manganese cations in g/l that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent in g/l as orthophosphoric acid, in the liquid composition that is from 0.050:1.00 to 0.15:1.00;
- (d) a concentration of nickel cations in g/l that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent in g/l as orthophosphoric acid in the liquid composition, that is at least 0.020:1.00;
- (e) at least one of:
  - (i) a source of hydroxylamine with a stoichiometric equivalent as hydroxylamine that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid, in the liquid composition, both of these concentrations being measured in g/l, that is from 0.0030:1.00 to 0.03:1.00; and
  - (ii) a concentration of iron cations that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid, in the liquid composition, both of these concentrations being measured in g/l, that is from 0.0007:1.00 to 0.010:1.00;
- (f) a concentration of calcium cations that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid, in

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the liquid composition, both of these concentrations being measured in g/l, that is from 0.030:1.00 to 0.080:1.00; and

- (g) a concentration in g/l of amino-phenolic polymers that has a ratio to the phosphate ions concentration, measured in g/l as its stoichiometric equivalent of orthophosphoric acid, in the liquid composition that is from 0.0020:1.0 to 0.020:1.00, wherein said amino-phenolic polymers have all of the following characteristics:
- (i) if all of the substituents on the aromatic rings that are substituted aminomethyl moieties and all of the substituents on the oxygen atoms bonded directly to the aromatic rings were replaced by hydrogen, the resulting polymer would be a polymer of a vinyl phenol with a weight average molecular weight that is from 300 to 10,000;
  - (ii) the nitrogen atoms in the substituted aminomethyl substituents on aromatic rings of the polymer molecules are bonded to three distinct carbon atoms each and are not amine oxides;
  - (iii) at least one of the moieties bonded to each nitrogen atom in the substituted aminomethyl substituents on the aromatic rings is a hydroxyalkyl moiety with from 2 to 6 carbon atoms; and
  - (iv) at least one of the moieties bonded to each nitrogen atom in the substituted aminomethyl substituents on the aromatic rings is an unsubstituted alkyl moiety having not more than 3 carbon atoms.

22. (Previously Presented) A liquid composition suitable for use as a dry-in-place phosphating composition for galvanized steel, said composition comprising water and the following dissolved components:

- (a) a concentration of from 53 to 400 g/l of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid;
- (b) a concentration in g/l of zinc cations that has a ratio to said concentration of phosphate ions, measured in g/l as their stoichiometric equivalent as orthophosphoric acid in the liquid composition, that is from 0.015:1.0 to 0.06:1.00;
- (c) a concentration of manganese cations in g/l that has a ratio to the concentration

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- of phosphate ions, measured as their stoichiometric equivalent in g/l as orthophosphoric acid, in the liquid composition that is from 0.050:1.00 to 0.15:1.00;
- (d) a concentration of nickel cations in g/l that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent in g/l as orthophosphoric acid in the liquid composition, that is at least 0.020:1.00;
- (e) at least one of:
- (i) a source of hydroxylamine with a stoichiometric equivalent as hydroxylamine that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid, in the liquid composition, both of these concentrations being measured in g/l, that is from 0.0030:1.00 to 0.03:1.00; and
  - (ii) iron cations in a concentration that has a ratio to the concentration of phosphate ions, measured as their stoichiometric equivalent as orthophosphoric acid, in the liquid composition, both of these concentrations being measured in g/l, that is from 0.0007:1.00 to 0.010:1.00, and
- (f) a concentration in g/l of film-forming acrylic polymers that has a ratio to the phosphate ions concentration, measured in g/l as its stoichiometric equivalent of orthophosphoric acid, in the liquid composition that is from 0.0020:1.0 to 0.020:1.00, wherein said acrylic polymers have all of the following characteristics:
- (i) when isolated from other materials, the acrylic polymers are a solid at 30° C and normal atmospheric pressure;
  - (ii) the acrylic polymers can be dissolved or stably dispersed in water to form a homogeneous solution in which the acrylic polymers constitute at least 5 % of the homogeneous solution;
  - (iii) when a homogeneous solution of the acrylic polymers in water that contains at least 0.10 cubic centimeters volume of the isolated acrylic polymers are dried at a temperature of 30° C in a walled container with a base area of 1.0 square centimeter and walls perpendicular to the base, there is formed in the base of said container a continuous solid article of the acrylic polymers, said continuous solid article, after being separated from the container in which it was

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formed by drying, having sufficient cohesion to sustain its integrity against the force of natural gravity of the Earth; and  
(iv) has a  $T_{300}$  value that is from 15 to 50° C.

**Claims 23 – 27 (Canceled)**